

## A New Species of *Pteromicra* from Western North America and Resurrection of *Pteromicra pleuralis* (Cresson)

(Diptera : Sciomyzidae)

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The new species described here was collected in northern California during a field survey related to University of California Agricultural Experiment Station Project 2037, "Biological control of noxious land snails and slugs and aquatic snail hosts of livestock liverfluke."

### *Pteromicra siskiyouensis* Fisher and Orth, new species

**HOLOTYPE MALE.**—Length of wing 3.0 mm. Head: Frontovortex shining black, bordered anteriorly by yellowish margin; face shining black, tinged with brown; gena white, pruinose; oral margin yellowish; occiput shining black; palpus wholly yellow; antenna yellowish; third segment blackish apico-dorsally; arista black with short plumosity; one fronto-orbital bristle. Thorax: Largely black; dorsum sub-shining, yellow (pollinose); anterior portion of pronotum shining; lateral margin of notum gray pruinose from humerus to wing base; propleuron dark brown, mesopleuron and pteropleuron shining; sternopleuron and hypopleuron gray pruinose; prosternum yellowish brown; pteropleuron with tuft of more or less uniform hairs. Legs: Fore coxa whitish with two strong antero-dorsal bristles; fore femur with pecten; basal two-thirds of femur yellow, remainder black; fore tibia black; fore tarsal segments one through four black, fifth segment dirty white; middle and hind legs wholly yellow except brownish fifth tarsal segments. Wing: Membrane uniformly hyaline with light brown veins; halter light yellow; squama whitish. Abdomen: black, shining, brownish ventrally; terminalia as illustrated in Figs. 1, 4, and 7.

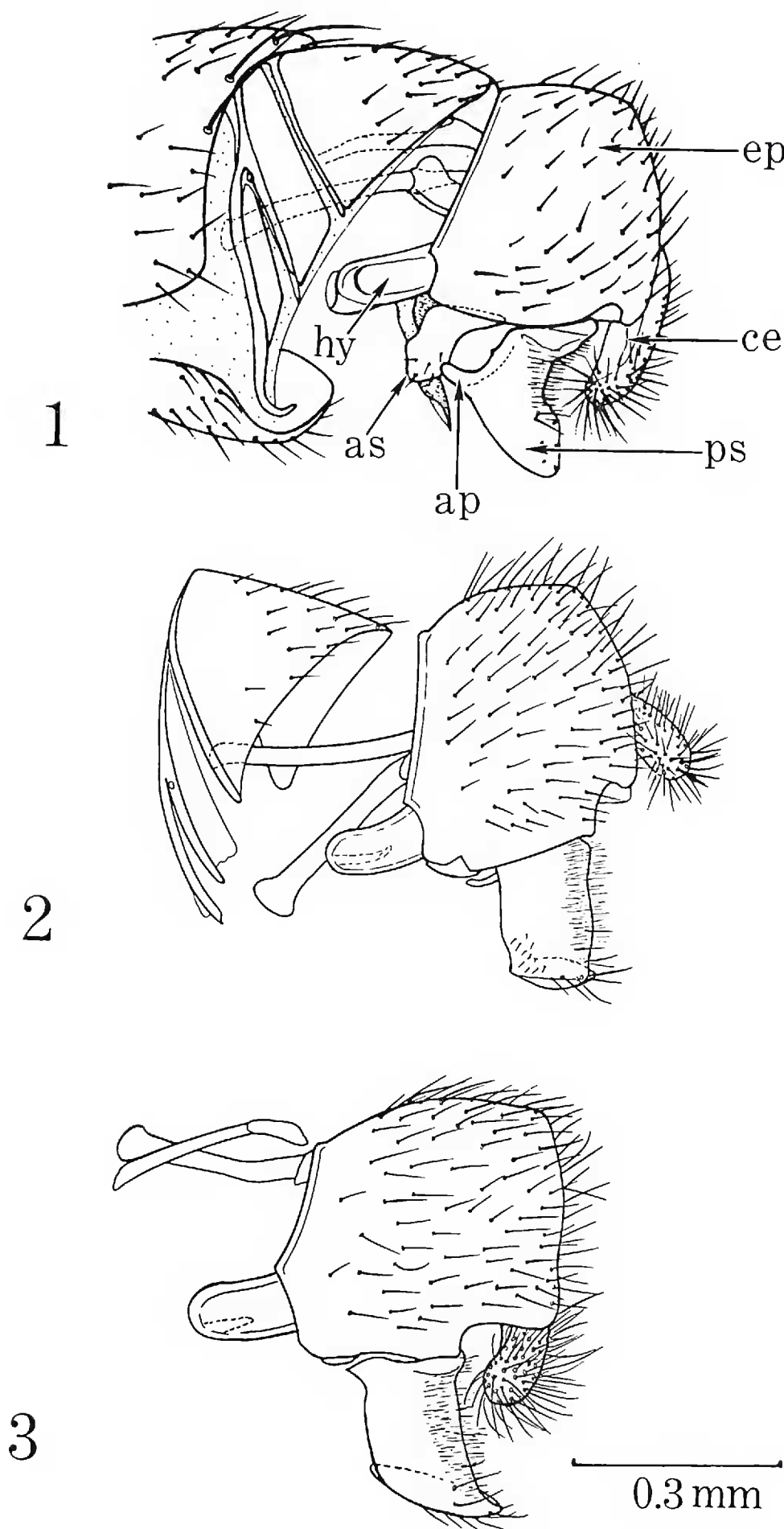
**ALLOTYPE FEMALE.**—Length of wing 4.0 mm. Coloration as in holotype; terminalia and spermatheca as shown in Figs. 10, 13, and 20.

**PARATYPES.**—24 males, length of wings 3.0 to 4.0 mm, average 3.5 mm; 15 females, length of wing 3.2 to 4.2 mm, average 3.7 mm. Variations—fourth tarsal segment of fore tarsi may be whitish apically. Material received from United States National Museum is lighter in color than our California specimens. This may be due to the age of the former.

**DISTRIBUTION AND LOCALITY DATA.**—The *holotype male*, allotype, and 9 male and 10 female paratypes from CALIFORNIA were taken along the SOUTHWESTERN SHORE OF GRASS LAKE ON HIGHWAY 97, SISKIYOU COUNTY; ELEVATION, 5122 FEET; LATITUDE, 41° 30' NORTH; LONGITUDE,

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122° 15' WEST APPROXIMATELY; 6 August 1965; collected by the authors; field notes accession number AS-371.

The habitat at this locality is a shallow fresh water marsh with abundant sedges emerging about 24 inches above the water and distributed over the entire surface of the lake. The only aquatic snails seen were *Stagnicola palustris nuttalliana* (Lea) and *Helisoma subcrenatum* (Carpenter). No living snails were seen on the wet shore over which part of the sample was taken.

Designated as paratypes from USNM material are: 5 males, Yellowstone Lake, Montana (now Wy.), 9 August 1918 (A. L. Melander); 1 male, Yellowstone Park, Canyon Camp, 12 August 1918 (A. L. Melander); 1 male, Priest Lake, Idaho, 3 September 1919 (A. L. Melander); 1 male, 1 female, Priest Lake, Soldier Creek, Idaho, 22 August 1919 (A. L. Melander); 2 males, 1 female, Chatcolet, Idaho, August 1915 (A. L. Melander); 1 male, Lake Waha, Idaho, 9 June 1918 (A. L. Melander); 1 male, Potlach, Idaho, 17 June 1911 (J. M. Aldrich); 1 male, Tacoma, Washington, 13 July 1915 (A. L. Melander); 1 male, Creston, Washington, 27 June 1924 (A. L. Melander); 1 male, Glenwood, Klickitat River, Washington, 27 June 1917 (A. L. Melander); 4 males, Pullman, Washington (3 from A. L. Melander collection, 1 from F. C. Baker collection), date illegible.

Designated as paratypes from the Kent State University (Ohio) entomological collection are: 1 male, 2 females, Bear Lake, Bear Lake, Idaho, 16 August 1965 (B. A. Foote); 1 male, 12 miles south of Rexford, Montana, 16 July 1965 (B. A. Foote); 4 males, 35 miles northwest of Glacier, Montana, 8 August 1965 (B. A. Foote); 1 female, 4 miles east of Big Fork, Montana, 10 August 1965 (B. A. Foote).

Also designated as a paratype is a female from the Cornell University collection: Vermillion Lake, 5 miles west of Banff, Alberta, Canada, August 1962 (B. A. Foote).

Total number of specimens examined was 36 males and 17 females.

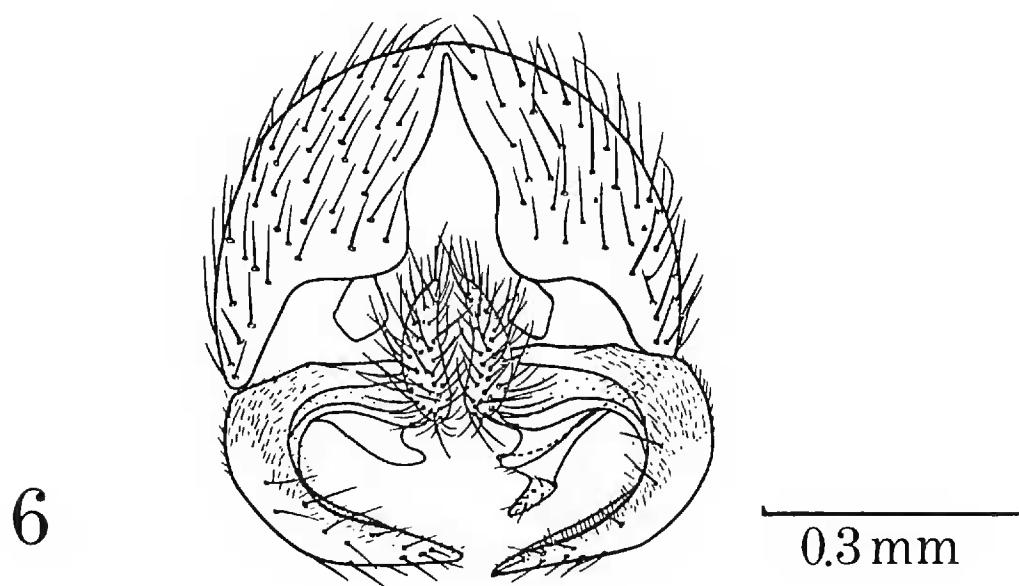
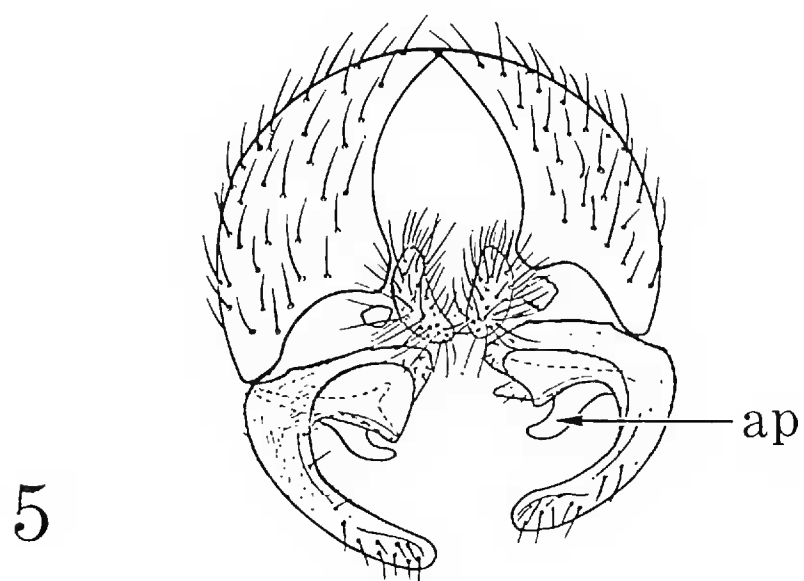
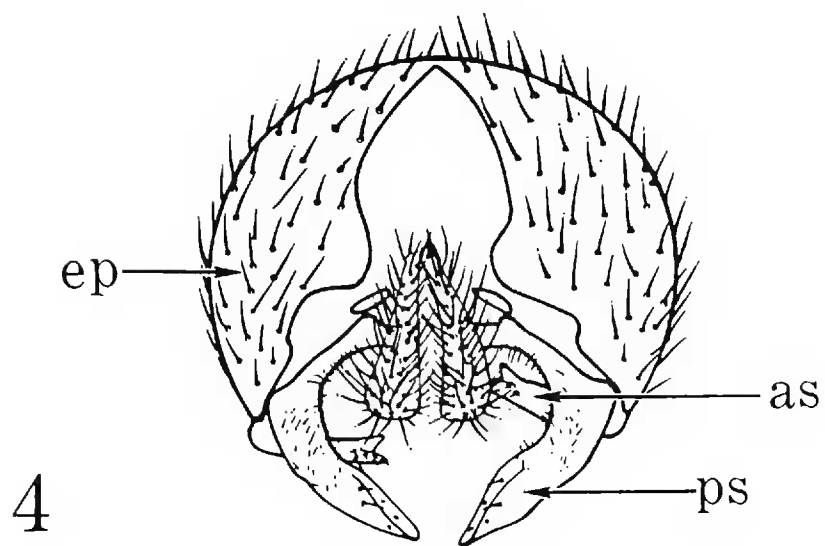
*P. siskiyouensis* appears to be confined to western North America and occurs in and west of the Rocky Mountains and/or above 45° N. latitude in California, Oregon, Washington, Idaho, Montana, and Wyoming. The northernmost locality we know of is represented by a male specimen collected 13 miles north of Banff, Alberta, Canada (approx-

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#### EXPLANATION OF FIGURES

Figs. 1-3. Lateral aspect of male terminalia. Fig. 1, *Pteromicra siskiyouensis* sp. no., holotype, Grass Lake, California. ap, anterior process of posterior surstylus; as, anterior surstylus; ce, cerci; ep, epandrium; hy, hypandrium; ps, posterior surstylus. (Anterior surstylus elevated in this drawing only.) Fig. 2, *P. pleuralis* (Cresson), Quebec, Quebec, Canada. Fig. 3, *P. nigrimana* (Meigen), Berlin, Germany.





mately 51° N. latitude), Banff-Jasper Highway (easterly slope of the Rocky Mountains), 4500' elevation, 25 July 1955 (R. Coyles). This specimen was obtained from G. E. Shewell, Canadian National Collection, Ottawa, and was determined by L. V. Knutson from our drawing of the holotype and by comparing it with a paratype sent to Cornell.

Material received from the Canada National Museum (courtesy of J. F. McAlpine) subsequent to submission of the original manuscript has extended distributional data as follows:

*Pteromicra siskiyouensis*: British Columbia (Oliver, Chilliwack, nr. Terrace, Sawmill Lake); Alberta (Banff, Jasper). All the foregoing localities are located west of the crest of the Rockies or the northerly extensions of that range into northwestern British Columbia and southeastern Alaska.

*P. pleuralis*: Alaska (mi 289, Richardson Hwy); British Columbia (Atlin); Alberta (Edmonton, Grande Prairie, McMurray, Morvin, Wabamun); Saskatchewan (Saskatoon); Manitoba (Aweme, Doloraine, Mafeking, Ninette, Stockton, Teulon); Ontario (Don Mills, Marmora, Orillia, Ottawa, Rondeau Park); New Brunswick (St. Andrews); Illinois (Champaign Co.).

*P. nigrimana*: Sweden (Abisko).

DEPOSITION OF TYPE MATERIAL.—21 paratypes (19 males, 2 females), U. S. National Museum; 3 paratypes (1 male, 2 female), Cornell University; 4 paratypes (3 males, 1 female), Kent State University; 2 paratypes (1 male, 1 female), California Academy of Sciences, San Francisco. The remainder of the type material is located in the museum of the Department of Biological Control, University of California, Riverside, California.

COMPARISON OF *PTEROMICRA NIGRIMANA*, *P. PLEURALIS*,  
*P. SISKIYOUENSIS*, AND *P. SP. DUB.*

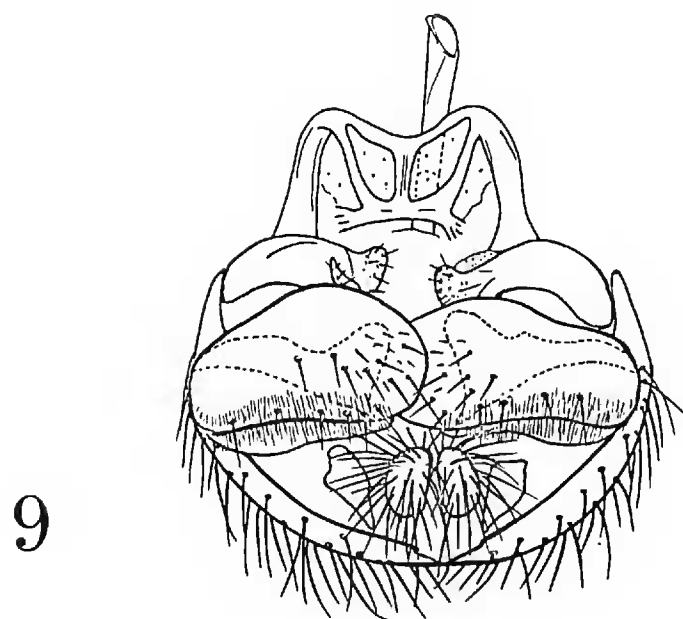
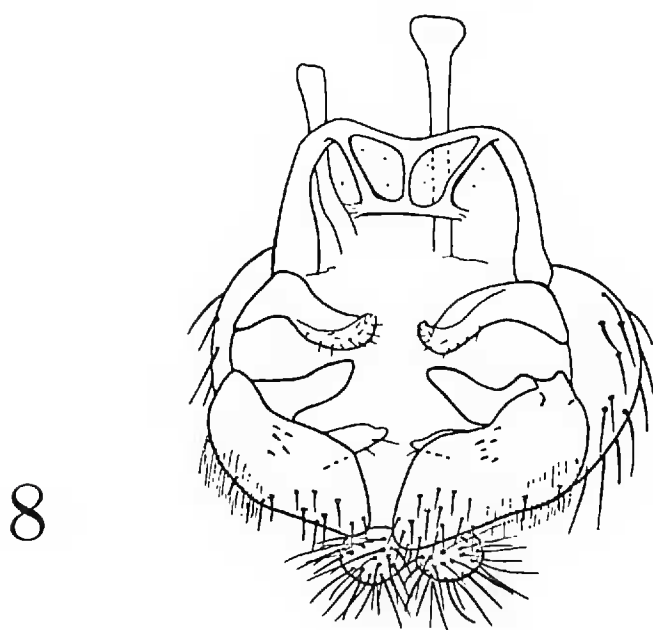
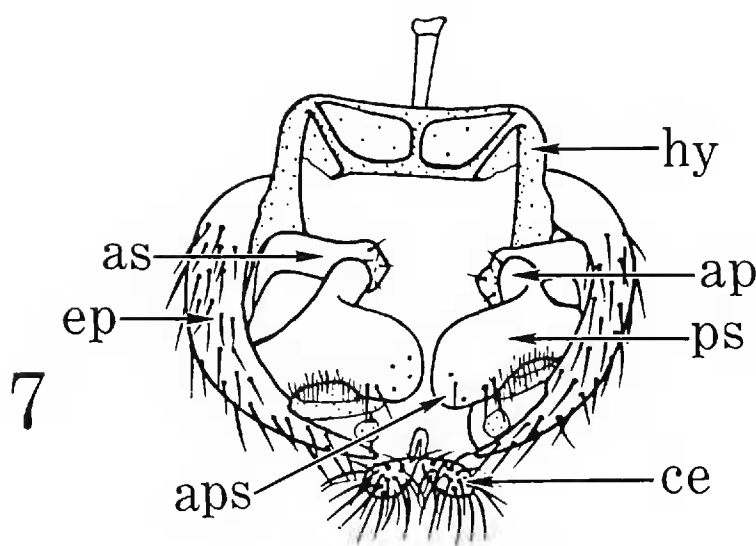
In Foote's key to the species of *Pteromicra* (1959), as modified from Steyskal (1954), *P. siskiyouensis* sp. nov. runs to *P. nigrimana* (Meigen) by external characters, but its genitalia are dissimilar to those figured by Steyskal (1954) for *P. nigrimana* from Berlin, Germany. Specimens and drawings of our California material were sent to Mr. Steyskal and he agreed that *P. siskiyouensis* was undescribed. Further, he re-

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EXPLANATION OF FIGURES

Figs. 4-6. Caudal aspect of male terminalia. Fig. 4, *P. siskiyouensis* sp. nov., holotype, Grass Lake, California. as, anterior surstylus; ep, epandrium; ps, posterior surstylus; Fig. 5, *P. pleuralis* (Cresson), Quebec, Quebec, Canada. ap, anterior process of posterior surstylus; Fig. 6, *P. nigrimana* (Meigen), Berlin, Germany.



0.3 mm

examined his material and expressed the opinion (correspondence 6 October 1965, with R. E. Orth) that the German and eastern North American specimens are subspecifically distinct. Subsequently Steyskal arranged for North American material labeled *P. nigrimana* from the United States National Museum to be sent to us for study. Some of these specimens have been incorporated into the *P. siskiyouensis* paratype series and have expanded the distributional data. Also included was one male from Berlin, Germany. Subsequently another male from Berlin and a female from Heusden, Belgium, were received from Steyskal. The female will be discussed later under the subtitle "*Pteromicra* sp. dub." Additional American and European material was loaned by C. O. Berg and L. V. Knutson, Cornell University, and B. A. Foote, Kent State University, loaned material from northwestern and eastern United States. We dissected many of these specimens, and, allowing for slightly different viewing angles, Steyskal's drawing (1954, p. 264) of the Berlin male and ours (Fig. 3) agree. After further studying the above-mentioned specimens, we concur with Steyskal that North American and European material presently designated "*Pteromicra nigrimana*" can be separated morphologically. The main basis of separation is provided by characters of the male postabdomen. Further, since these two forms are separated by the North Atlantic Ocean, it can be assumed that they are exhibiting independent speciation, and therefore from a pragmatic view should be considered reproductively isolated. Therefore, we choose to resurrect *Pteromicra pleuralis* (Cresson, 1920) (placed in synonymy under *P. nigrimana* by Melander, 1920) as the appellation designating the North American species. We have examined Cresson's type specimen (collected at Swarthmore, Pennsylvania) and it fits our criteria for the species. We also choose to let the European species stand as *Pteromicra nigrimana* (Meigen). We have examined specimens from Denmark and Finland and, although they show slight variations from the Berlin form, they, too, can be regarded as *Pteromicra nigrimana*.

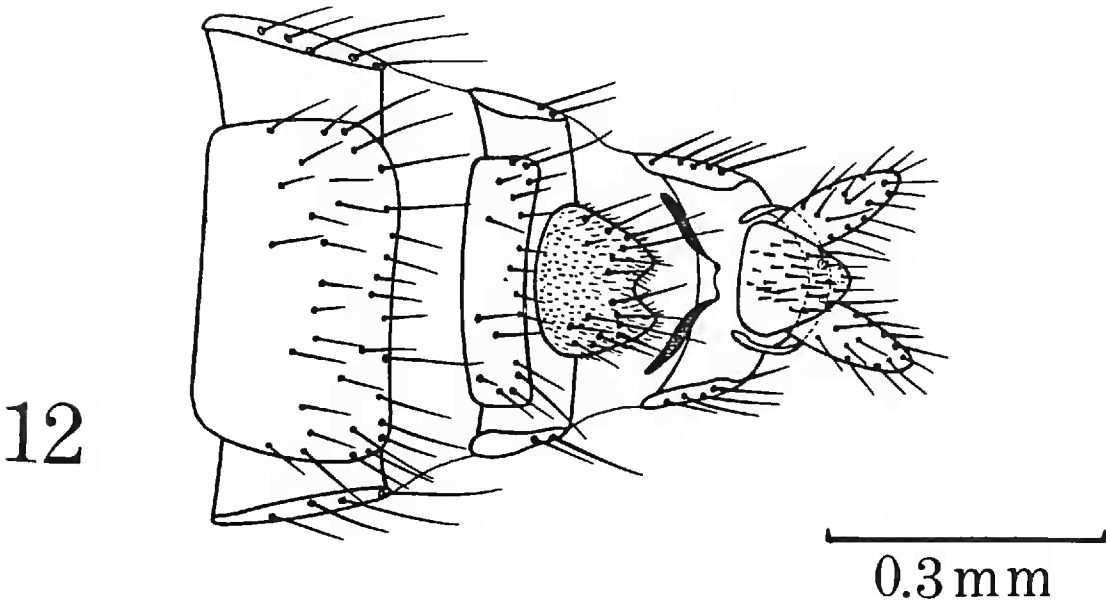
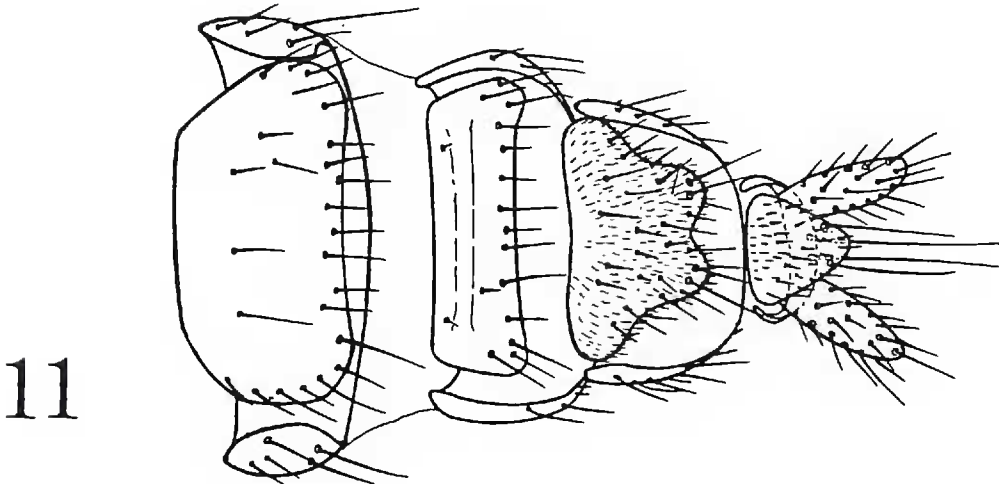
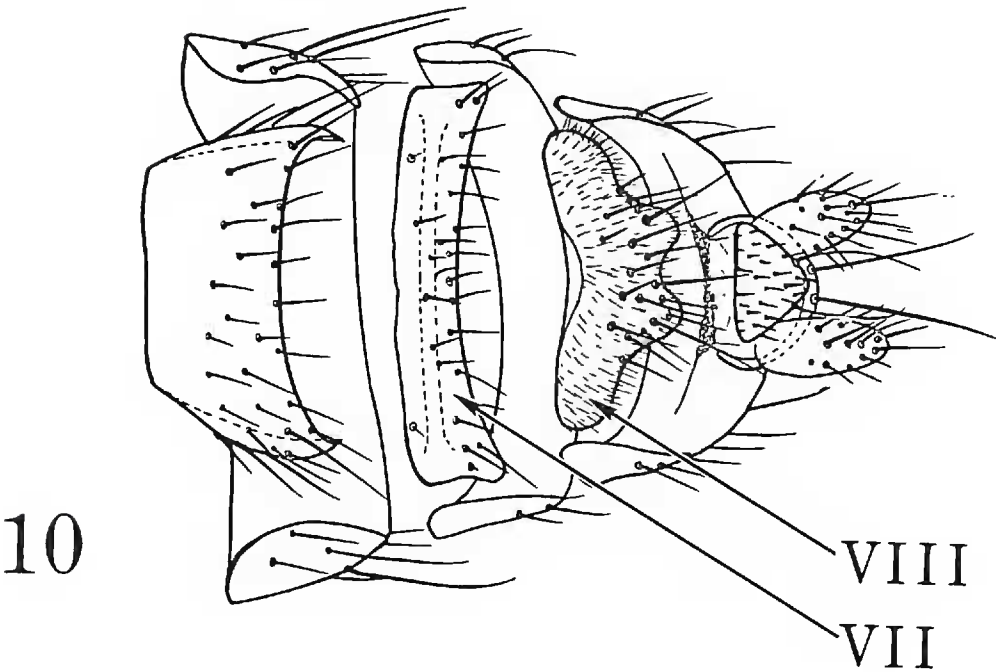
The total number of *P. pleuralis* and *P. nigrimana* examined by us

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#### EXPLANATION OF FIGURES

Figs. 7-9. Ventral aspect of male terminalia. Fig. 7, *Pteromicra siskiyouensis* sp. nov., holotype, Grass Lake, California. ap, anterior process of posterior surstylus; aps, apex of posterior surstylus; as, anterior surstylus; ce, cerci; ep, epandrium; hy, hypandrium; ps, posterior surstylus; Fig. 8, *P. pleuralis* (Cresson), Quebec, Quebec, Canada. Fig. 9, *P. nigrimana* (Meigen), Berlin, Germany.





was 27 males and 15 females of the former and 29 males and 22 females of the latter.

With our material it is rather easy to separate the males of *P. pleuralis* and *P. nigrimana* by differences in the configuration of the surstyli (Figs. 2, 3). When viewed caudally the posterior surstyli of *P. nigrimana* bend inwardly at a sharper angle and are pressed closer to the epandrium than are those of *P. pleuralis* (Figs. 5, 6). Viewed ventrally the apex of the posterior surstylus of *P. pleuralis* is angulate, whereas in *P. nigrimana* it is rounded and appears to be somewhat broader (Figs. 8, 9). Even though Figs. 8 and 9 are slightly different views the angulate or rounded characteristic of the apex of the posterior surstylus is readily apparent and provides the chief means for ready separation of the two species. *Pteromicra siskiyouensis* sp. nov. is readily distinguished from both *P. nigrimana* and *P. pleuralis* by the prominent, anteriorly directed, finger-like process located midway on the anterior margin of the posterior surstylus (Fig. 1). These basic differences in genitalia make interspecific hybridization seem unlikely. In *P. pleuralis* this process is located basally at the anterior margin of the surstylus and is directed inwardly (Fig. 2), and from a lateral aspect may or may not be seen. In *P. nigrimana* the process lies slightly more posterad and is not seen in lateral aspect.

Females can usually be separated by differences of abdominal sternite VIII and width of sternite VII (Figs. 11, 12, and 13). In general it can be said that when proceeding from easterly to westerly longitudes sternite VII becomes wider, and sternite VIII becomes shorter and wider. These characteristics are best developed in *P. siskiyouensis*. It was also noted that sternite VIII of *P. nigrimana* exhibits a triangular dark area (seen after clearing with KOH) which was not detected in *P. pleuralis*.

#### PTEROMICRA SP. DUB.

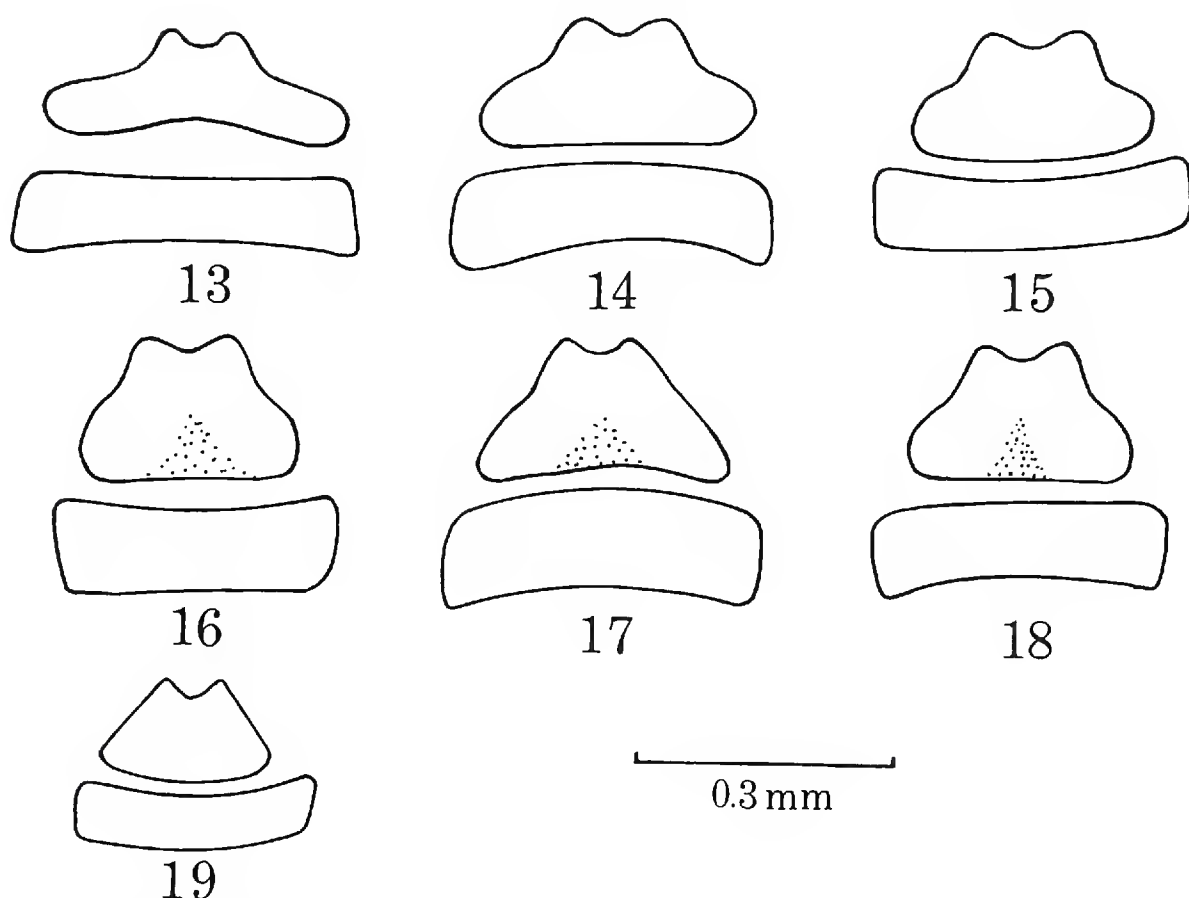
The female from Heusden, Belgium, in USNM was collected and determined by J. Verbeke as *P. nigrimana* (Meigen), but it was so mutilated that we could not identify it as such from external characters. This specimen we designate *P. sp. dub.* Dissection revealed abdominal ster-

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#### EXPLANATION OF FIGURES

Figs. 10-12. Female terminal sternites. Fig. 10, *Pteromicra siskiyouensis* sp. nov., allotype, Grass Lake, California. Fig. 11, *P. pleuralis* (Cresson), Kent, Ohio. Fig. 12, *P. sp. dub.*, Heusden, Belgium.

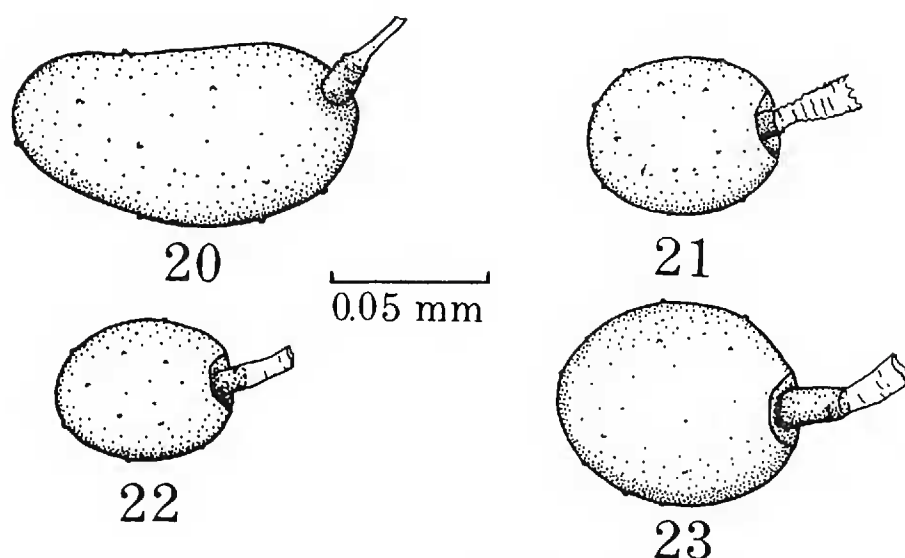


Figs. 13-19. Female abdominal sternites VII and VIII. Fig. 13, *P. siskiyouensis* sp. nov., paratype, Grass Lake, California; Fig. 14, *P. pleuralis* (Cresson), Kent, Ohio; Fig. 15, *P. pleuralis* (Cresson), Ringwood, New York; Fig. 16, *P. nigrimana* (Meigen), Tvarminne, Finland; Fig. 17, *P. nigrimana* (Meigen), Sjaelland, Denmark; Fig. 18, *P. nigrimana* (Meigen), Vollerup, Denmark; Fig. 19, *P. sp. dub.*, Heusden, Belgium.

nites VII and VIII and the spermathecae to be very different from those of the identifiable females of *P. pleuralis* and *P. nigrimana* at our disposal (Figs. 12, 14, 15, 16, 17, and 18). By comparison with *P. nigrimana* the general body color is much lighter; sternite VII is narrower; sternite VIII is not markedly extended laterally and its anterior peaks come to sharp points; and the spermathecae are quite large (Figs. 12, 19, and 23) when compared to those of *P. pleuralis* and *P. nigrimana* (Figs. 21 and 22). It is our opinion that this specimen belongs to another species of *Pteromicra*—possibly *P. pectorosa*.

#### REMARKS

Topographic isolation of a segment of an assumed boreal species by the rising of the Rocky Mountains appears to be the obvious factor that has permitted *P. siskiyouensis* to speciate west of those mountains. All



Figs. 20-23. Spermathecae. (One of each pair illustrated; no appreciable difference between left and right spermathecae in material examined.) Fig. 20, *P. siskiyouensis* sp. nov., paratype, Grass Lake, California. Fig. 21, *P. pleuralis* (Cresson), Kent, Ohio. Fig. 22, *P. nigrimana* (Meigen), Funkedam, Zealand, Denmark. Fig. 23, *P. sp. dub.*, Heusden, Belgium.

of the specimens (both sexes) from west of the Rockies are unmistakably *P. siskiyouensis*, whereas at a relatively short distance east of the Rockies at Lusk, Wyoming, characteristic *P. pleuralis* occurs. This locality may be a relict area for the species, since the remainder of our material was taken east of 98° longitude. It is our opinion that *P. siskiyouensis* and *P. pleuralis* are Nearctic, and *P. nigrimana* is Palearctic in distribution.

The collecting method used to obtain our specimens of *P. siskiyouensis* at Grass Lake is worth comment. On 5 August 1965, about 5:00 p.m., a site on the lake margin was swept with a conventional aerial net, and 9 sciomyzid flies of the following genera were taken: *Dictya* (2), *Elgiva* (1), *Sepedon* (4), and *Tetanocera* (2). To obtain more specimens, the site was revisited about 10 a.m. the following morning and was gone over with a D-Vac suction collector. This sample yielded 101 sciomyzid flies representing 7 genera, including 21 *P. siskiyouensis*. Just before the D-Vac collection, at a similar site 400 yards to the west, a sweep net sample yielded 16 sciomyzid flies, but no *P. siskiyouensis*. No other species of *Pteromicra* were taken at Grass Lake.

#### ACKNOWLEDGMENTS

The interest shown by C. O. Berg, B. A. Foote, L. V. Knutson, and G. C. Steyskal, as well as the generous loan of their material, were major

factors in expanding the scope of our original rather restricted effort. Selwyn Roback of the Academy of Natural Sciences of Philadelphia arranged to have Cresson's type specimen sent to Riverside.

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### A Preliminary List of the Sciomyzidae of California (Diptera)

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A survey of insects associated with land and fresh water mollusks has been in progress since 1962. This work is related to Agr. Exp. Sta. Project No. 2037 titled "Biological control of noxious land snails and slugs and aquatic snail hosts of livestock liverfluke." Attention has focused in particular on marsh flies whose larvae are known to feed on fresh water and terrestrial mollusks. Field and laboratory records to date show that associations with aquatic snails far exceed those with terrestrial mollusks. Since 1953, C. O. Berg, Cornell University, Ithaca, N. Y., and his students have published approximately 30 papers on the taxonomy and biology of certain North American species mainly from east of the Rocky Mountains, Central America, and Europe. Foote (1961) reported species collected in the northwestern United States. G. C. Steyskal, United States National Museum specialist in the family, has described many new taxa, and he has provided keys to the known